OR-6

INVESTIGATION OF TWO-PHASE FLOW HYDRODYNAMICS OF HEAT EXCHANGE TUBE OUTLET FALLING FILM EVAPORATOR

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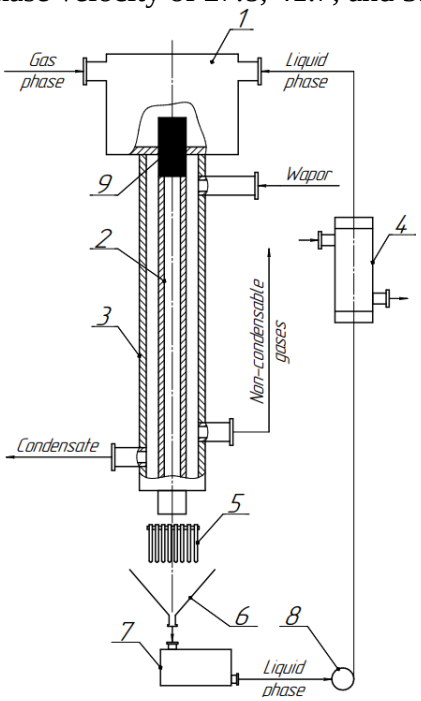
Abstract. Studies of hydrodynamics and heat transfer in falling film evaporators are presented in a significant number of scientific papers [1, 2, 3]. This work is devoted to the study of a distribution of a gas phase velocity and a liquid phase irrigation density at the outlet of the heat exchange tube of the falling film evaporator.

For this study, the experimental setup was used, which shown in figure 1. The studies were performed at the gas phase velocity of 27.8, 41.7, and 55.6 m/s and the liquid phase flow rate of 100 l/h.



1. Upper solution chamber;
2. Heat exchange tube;
3. Evaporator;
4. Heat exchanger;
5. Test tube cassette;
6. Funnel;
7. Condensate tank;
8. Pump;
9. Distribution device

Figure 1. Installation diagram of the film evaporator

The study obtained data on the distribution of the gas phase velocity and the liquid phase irrigation density at a distance of 0.2, 0.4, 0.6 and 0.75 m from the lower section of the heat exchange tube.

The obtained data are necessary for the development of the lower solution chamber and separator of the film-type evaporator.

References

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